CLAIMS

What is claimed is:

1.   An apparatus comprising:

a flow manager;

a remote logical port (RLP) model to model a remote physical port (RPP); and

a trunk scheduler to schedule transmission units direct to the remote physical port.

2.   The apparatus of claim 1 wherein the flow manager comprises:

a flow shaper; and

a flow parameter database.

3.   The apparatus of claim 1 wherein the flow manager comprises:

a discard policy that is able to differentiate between the discard rates of at least two flows; and

a flow parameter database.

4.   The apparatus of claim 1 wherein the flow manager comprises:

an RLP scheduler; and

a flow parameter database.

5.   The apparatus of claim 2 wherein the flow manager further comprises:

an RLP scheduler.

6.   The apparatus of claim 1 wherein the RLP model comprises:

an RLP data structure to hold data indicating characteristics of the RPP; and

an RLP traffic shaper to make a transmission unit eligible consistent with the characteristics of the RPP.

7.   The apparatus of claim 5 wherein the flow manager comprises a plurality of queues, one queue for each flow directed toward the RPP.

8.   The apparatus of claim 7 wherein shaping and scheduling are performed by manipulating pointers to the queues.

9.   The apparatus of claim 1 wherein the trunk scheduler statistically multiplexes an aggregate of the flows directed to a plurality of RPPs.

10.   The apparatus of claim 1 wherein the trunk scheduler operates in a weighted round robin non-work conserving manner.

11.   The apparatus of claim 1 further comprising one of an OC-3 port and a DS-3 port.

12.   A system comprising:
        a broadband communication link;
        a demultiplexer coupled to a plurality of physical ports and the broadband communication link; and
        a network element coupled to the communication link, the network element modeling the plurality of physical ports and providing a two-tier hierarchy of shaping and scheduling of flows directed to the plurality of physical ports.

13.   The system of claim 12 wherein the network element comprises:
        a first flow shaper to shape a plurality of flows directed to a remote physical port (RPP);
        a first scheduler to schedule the flows shaped by the first flow shaper to yield a scheduled flow;
        a second flow shaper to shape the scheduled flow; and
        a trunk scheduler to schedule the flow shaped by the second flow shaper for transmission to the RPP.

14.   The system of claim 12 further comprising:

a plurality of data structures populated with data indicating characteristics of a remote physical port (RPP); and

5   a database populated with flow parameters.

15.   The system of claim 14 wherein a one-to-one correspondence exists between RLP data structures and RPPs.

10   16.   The system of claim 13 wherein the network element comprises:

a queue for each flow directed at a physical port and wherein shaping and scheduling are performed by pointer manipulation.

17.   A method comprising:

15   modeling a plurality of remote physical ports (RPP) as a plurality of remote logical ports (RLP); and

reflecting quality of service from a control aggregator to the plurality of RPPs.

20   18.   The method of claim 17 wherein reflecting comprises:

shaping a plurality of flows directed to a RPP into a plurality of shaped flows;

scheduling the shaped flow into a scheduled flow;

shaping the scheduled flow into a shaped scheduled flow; and

25   scheduling the shaped scheduled flow for transmission to the RPP.

19.   The method of claim 17 wherein modeling comprises:

populating a database with an entry indicating an ability of an

30   RPP to transmit data.

20.   The method of claim 19 wherein modeling further comprises:

creating a data structure for each flow directed to a remote physical port; and

manipulating the data structure to indicate eligibility of a transmission unit consistent with the ability of the RPP to transmit data.

21.   The method of claim 17 further comprising:

statistically multiplexing the flows from the plurality of RLPs to the plurality of RPPs.

22.   The method of claim 17 wherein a one-to-one correspondence exists between the RLPs and the RPPs.